

APPENDIX F
LEVEL I ECOLOGICAL RISK ASSESSMENT
ATTACHMENTS

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I - SCOPING

ATTACHMENT 1
Ecological Scoping Checklist

Site Name	USACE former North Pacific Division (NPD) laboratory
Date of Site Visit	July 23, 2002
Site Location	1491 Northwest Graham Rd., Troutdale, Multnomah County, Oregon
Site Visit Conducted by	Burt Shephard and Cindy Jones

Part 1

CONTAMINANTS OF INTEREST Types, Classes, Or Specific Hazardous Substances [‡] Known or Suspected	Onsite	Adjacent to or in location of the facility[†]
Metals (Al, As, Ba, Be, Cd, Cr, Fe, Pb, Mn, Hg, Ni, Se, V, Zn)	Soil	
Metals (Al, Ba, Cu, Fe, Pb, V)	GW	
PAHs (8 compounds including benzo(b)fluoranthene, chrysene, benzo(a)anthracene, benzo(a)pyrene, benzo(a)anthracene)	Soil	
Heavy Oil range and Diesel range petroleum hydrocarbons	Soil	
VOCs (Benzene, acetone, 2-butanone, 1,2-dibromomethane)	Soil	
PCB (Aroclors 1254, 1260)	Soil	
Broken concrete blocks	Soil	

[‡] As defined by OAR 340-122-115(30)

[†] As defined by OAR 340-122-115(34)

Part 2

OBSERVED IMPACTS ASSOCIATED WITH THE SITE	Finding
Onsite vegetation (None, Limited, Extensive)	L
Vegetation in the locality of the site (None, Limited, Extensive)	E
Onsite wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other (None, Limited, Extensive)	L
Wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other in the locality of the site (None, Limited, Extensive)	E
Other readily observable impacts (None, Discuss below)	
Discussion:	
No direct impacts associated with detected chemicals were observed. No staining or seeps from the landfill were observed.	
Physical impacts due to bulldozing during 2001 of the landfill portion of the northern parcel resulted in vegetation being limited to ruderal, patchy low growing species with no shrubs or trees. Onsite wildlife observed in the landfill area was limited to one western garter snake and a few insects.	
Southern parcel is completely paved and contains the laboratory building, except for a strip of landscape grass with a few plum trees on the eastern edge of the southern parcel.	
No impacts from the NPD laboratory on vegetation or wildlife were observed in the locality of the site.	

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I - SCOPING

ATTACHMENT 1
Ecological Scoping Checklist (cont'd)

Part 3

SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT	Finding
<i>Terrestrial - Wooded</i>	
Percentage of site that is wooded	2%
Dominant vegetation type (Evergreen, Deciduous, Mixed)	D
Prominent tree size at breast height, i.e., four feet (<6", 6" to 12", >12")	<6"
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	Mac, B, Mam
<i>Terrestrial – Scrub/Shrub/Grasses</i>	
Percentage of site that is scrub/shrub	2%
Dominant vegetation type (Scrub, Shrub, Grasses, Other)	G, Sh
Prominent height of vegetation (<2', 2' to 5', >5')	2' to 5'
Density of vegetation (Dense, Patchy, Sparse)	D
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	Mac, B, Mam
<i>Terrestrial- Ruderal</i>	
Percentage of site that is ruderal	95%
Dominant vegetation type (Landscaped, Agriculture, Bare ground)	B, L
Prominent height of vegetation (0', >0' to <2', 2' to 5', >5')	>0' to 2'
Density of vegetation (Dense, Patchy, Sparse)	S
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	Mac, R, B, Mam
<i>Aquatic – Non-flowing (lentic)</i>	
Percentage of site that is covered by lakes or ponds	0%
Type of water bodies (Lakes, Ponds, Vernal pools, Impoundments, Lagoon Reservoir, Canal)	N/A
Size (acres), average depth (feet), trophic status of water bodies	N/A
Source water (River, Stream, Groundwater, Industrial discharge, Surface water runoff)	N/A
Water discharge point (None, River, Stream, Groundwater, Wetlands impoundment)	N/A
Nature of bottom (Muddy, Rocky, Sand, Concrete, Other)	N/A
Vegetation present (Submerged, Emergent, Floating)	N/A
Obvious wetlands present (Yes / No)	N/A
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	N/A
<i>Aquatic – Flowing (lotic)</i>	
Percentage of site that is covered by rivers, streams (brooks, creeks), intermittent streams, dry wash, arroyo, ditches, or channel waterway	<1%
Type of water bodies (Rivers, Streams, Intermittent streams, Dry wash, Arroyo, Ditches, Channel waterway)	Ditches
Size (acres), average depth (feet), approximate flow rate (cfs) of water bodies	<0.1, dry
Bank environment (cover: Vegetated, Bare / slope: Steep, Gradual / height (in feet)	V, S, 1 - 3
Source water (River, Stream, Groundwater, Industrial discharge, Surface water runoff)	S
Tidal influence (Yes / No)	N
Water discharge point (None, River, Stream, Groundwater, Wetlands impoundment)	G
Nature of bottom (Muddy, Rocky, Sand, Concrete, Other)	S, C
Vegetation present (Submerged, Emergent, Floating)	E
Obvious wetlands present (Yes / No)	N
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	None observed

Oregon Department of Environmental Quality

LEVEL I - SCOPING

SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT	Finding
<i>Aquatic – Wetlands</i>	
Obvious or designated wetlands present (Yes / No)	N
Wetlands suspected as site is/has (Adjacent to water body, in Floodplain, Standing water, Dark wet soils, Mud cracks, Debris line, Water marks)	N/A
Vegetation present (Submerged, Emergent, Scrub/shrub, Wooded)	N/A
Size (acres), average depth (feet) of suspected wetlands	N/A
Source water (River, Stream, Groundwater, Industrial discharge, Surface water runoff)	N/A
Water discharge point (None, River, Stream, Groundwater, Wetlands impoundment)	N/A
Tidal influence (Yes / No)	N/A
Evidence / observation of wildlife (Macroinvertebrates, Reptiles, Amphibians, Birds, Mammals, Other)	N/A

* **P**: Photographic documentation of these features is highly recommended.

Part 4

[illegible]

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I - SCOPING

ATTACHMENT 2
Evaluation of Receptor-Pathway Interactions

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in surface waters? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via surface water?		N	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in surface waters. • Ability of hazardous substances to migrate to surface waters. • Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters. Aquatic receptors may be exposed through osmotic exchange, respiration or ventilation of surface waters. • Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters. • Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source. 			
Are hazardous substances present or potentially present in groundwater? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via groundwater?	Y	N	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in groundwater. • Ability of hazardous substances to migrate to groundwater. • Potential for hazardous substances to migrate via groundwater and discharge into habitats and/or surface waters. • Contaminants may be taken-up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1m depth). • Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface. 			

“Yes” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

Oregon Department of Environmental Quality
GUIDANCE FOR ECOLOGICAL RISK ASSESSMENT
LEVEL I - SCOPING

ATTACHMENT 2
Evaluation of Receptor-Pathway Interactions (cont'd)

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in sediments? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via contact with sediments?		N	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in sediment. • Ability of hazardous substances to leach or erode from surface soils and be carried into sediment via surface runoff. • Potential for contaminated groundwater to upwell through, and deposit contaminants in, sediments. • If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods. Aquatic receptors may be directly exposed to sediments or may be exposed through osmotic exchange, respiration or ventilation of sediment pore waters. • Terrestrial plants may be exposed to sediment in an area that is only periodically inundated with water. • If sediments are present in an area that is only periodically inundated with water, terrestrial species may have direct access to sediments for the purposes of incidental ingestion. Aquatic receptors may regularly or incidentally ingest sediment while foraging. 			
Are hazardous substances present or potentially present in prey or food items of ecologically important receptors? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via consumption of food items?		N	U
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Higher trophic level terrestrial and aquatic consumers and predators may be exposed through consumption of contaminated food sources. • In general, organic contaminants with $\log K_{ow} > 3.5$ may accumulate in terrestrial mammals and those with a $\log K_{ow} > 5$ may accumulate in aquatic vertebrates. 			

“Yes” = yes; “N” = No, “U” = Unknown (counts as a “Y”)

Oregon Department of Environmental Quality
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LEVEL I - SCOPING

ATTACHMENT 2
Evaluation of Receptor-Pathway Interactions (cont'd)

EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS	Y	N	U
Are hazardous substances present or potentially present in surficial soils? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via incidental ingestion of or dermal contact with surficial soils?	Y	N	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Known or suspected presence of hazardous substances in surficial (~1m depth) soils. • Ability of hazardous substances to migrate to surficial soils. • Significant exposure via dermal contact would generally be limited to organic contaminants which are lipophilic and cross epidermal barriers. • Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash). • Contaminants in bulk soil may partition into soil solution, making them available to roots. • Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil. 			
Are hazardous substances present or potentially present in soils? AND Are ecologically important species or habitats present? AND Could hazardous substances reach these receptors via vapors or fugitive dust carried in surface air or confined in burrows?	Y	N	
When answering the above questions, consider the following: <ul style="list-style-type: none"> • Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $> 10^{-5}$ atm-m³/mol and molecular weight < 200 g/mol). • Exposure via inhalation is most important to organisms that burrow in contaminated soils, given the limited amounts of air present to dilute vapors and an absence of air movement to disperse gases. • Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that could be exposed to dust disturbed by their foraging or burrowing activities or by wind movement. • Foliar uptake of organic vapors would be limited to those contaminants with relatively high vapor pressures. • Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces. 			

"Yes" = yes; "N" = No, "U" = Unknown (counts as a "Y")

Vegetation description* of the former NPD laboratory, Troutdale, Oregon, July 23, 2002

North of road (landfill and margins)

South of the road, the site was approximately 20-30% wooded in the margins of the landfill, predominately with <6" diameter deciduous trees. Black cottonwood was the dominant species, comprising approximately 50% of vegetative cover. Shrubs/vines were also common in the margins including Himalayan blackberry (50%) and Scot's broom (10%). The remainder of the North part of the site was composed of ruderal, predominately non-native species. Cover on top of the landfill was 20-30% Himalyan blackberry, 60-70% white sweetclover and rabbitfoot clover, and approximately 5% bare ground and concrete.

South of road (buildings, parking lot, grassy strips)

A grassy strip is located on the east end of the site. The sump drainage area, located in this area contained a variety of (predominately non-native) species including: Himalayan blackberry, reed canary grass, and Queen Anne's lace.

VEGETATION SPECIES LIST

Scientific Name	Common Name	Native?	Location
Trees (6)			
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	Black cottonwood	Y	Landfill margins
<i>Prunus</i> sp.	cultivated plum	N	E of lab near sump drainage
<i>Pseudotsuga menziesii</i>	Douglas-fir	Y	E of landfill near edge of site
<i>Salix sitchensis</i>	Sitka willow	Y	S of landfill, near ditch/fence
<i>Salix</i> sp.	Willow	Y	Landfill margins
<i>Thuja plicata</i>	Western red cedar	Y	Landfill margins
Shrubs (4)			
<i>Buddleia davidii</i>	Butterfly bush	N	W side of landfill
<i>Cornus stolonifera</i>	Red-osier dogwood	Y	S of landfill, near ditch/fence
<i>Cytisus scoparius</i>	Scot's broom	N	top/margins of landfill
<i>Rosa</i> sp.	Rose	?	N of landfill on Reynold's property
Vines (4)			
<i>Convolvulus arvensis</i>	field bindweed	N	N of landfill on Reynold's property
<i>Lathyrus</i> sp.	pea	?	N of landfill on Reynold's property
<i>Rubus discolor</i>	Himalayan blackberry	N	top/margins of landfill
<i>Rubus lanciniatus</i>	Evergreen blackberry	N	top/margins of landfill
Grasses (7)			
<i>Agrostis capillaris</i>	Colonial bentgrass	N	N/NE of landfill on Reynold's property
<i>Agrostis gigantea</i>	Redtop	N	N/NE of landfill on Reynold's property
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass	N	various areas on site and Reynold's property
<i>Dactylus glomerata</i>	Orchard grass	N	NW of landfill on Reynold's property
<i>Festuca arundinacea</i>	Tall fescue	N	various areas on site and Reynold's property
<i>Holcus lanatus</i>	Common velvet-grass	N	various areas on site and Reynold's property
<i>Phalaris arundinacea</i>	Reed canary grass	N?	sump drainage area
Herbs (19)			
<i>Asparagus officinalis</i>	garden asparagus	N	E of lab near sump drainage
<i>Carex</i> sp.	sedge	?	sump drainage area
<i>Centaurea</i> sp.	knapweed	N	landfill area
<i>Centaureium umbellatum</i>	Little centaury	N	N/NE of landfill on Reynold's property
<i>Cirsium arvense</i>	Canada thistle	N	scattered throughout site
<i>Daucus carota</i>	Queen Anne's lace	N	scattered throughout site
<i>Equisetum arvense</i>	Common horsetail	Y	sump drainage area
<i>Erodium cicutarium</i>	Common stork's-bill	N	various
<i>Hieracium</i> sp.	Hawkweed	?	scattered throughout site
<i>Hypericum perforatum</i>	Common St. John's wort	N	scattered throughout site
<i>Melilotus alba</i>	white sweetclover	N	top of landfill
<i>Plantago lanceolata</i>	Plantain	N	parking lot area
<i>Rumex acetosella</i>	Red sorrel	N	S of landfill
<i>Senecio jacobaea</i>	tansy ragwort	N	N of landfill on Reynold's property
<i>Taraxacum officinale</i>	Dandelion	N	parking lot area
<i>Trifolium arvense</i>	rabbitfoot clover	N	top of landfill
<i>Trifolium repens</i>	white clover	N	parking lot area
<i>Verbascum thapsus</i>	Common mullein	N	scattered throughout site
<i>Vicia americana</i>	American vetch	Y	N of landfill on Reynold's property

*Estimates of extent of vegetation communities could be refined with use of aerial photography.

Wildlife species observed at the former NPD laboratory, Troutdale, Oregon, July 23, 2002

Common name	Scientific name	Location
Birds (9)		
Turkey vulture	<i>Cathartes aura</i>	Above northern parcel
Swainson's thrush	<i>Catharus ustulatus</i>	Margin of northern parcel, Reynolds property
Song sparrow	<i>Melospiza melodia</i>	Margin of northern parcel, Reynolds property
Spotted towhee	<i>Pipilo maculatus</i>	Margin of northern parcel, Reynolds property
Black-capped chickadee	<i>Poecile atricapillus</i>	Margin of northern parcel, Reynolds property
American robin	<i>Turdus migratorius</i>	Margin of northern parcel, Reynolds property
Mourning dove	<i>Zenaida macroura</i>	Margin of northern parcel, Reynolds property
American crow	<i>Corvus brachyrhynchos</i>	Sitewide and locality of site
House wren	<i>Troglodytes aedon</i>	Margin of northern parcel, Reynolds property
Mammals (4)		
Vole/mole	species unknown	Reynolds property
Black-tailed deer	<i>Odocoileus hemionus columbianus</i>	Northern parcel, Reynolds property
Raccoon	<i>Procyon lotor</i>	Reynolds property
Western gray squirrel	<i>Sciurus griseus</i>	Margin of northern parcel
Reptiles (1)		
Northwestern garter snake	<i>Thamnophis ordinoides</i>	Top of landfill

APPENDIX G

ECOLOGICAL RISK ASSESSMENT SITE PHOTOGRAPHS